

5. LIMIT THEORY

Invariance Theorems on First Passage Times for Dependent Random Variables

A.K. Basu, *Calcutta University, Calcutta, India*

Let X_1, X_2, \dots be a stationary sequences of random variables with $EX = \mu > 0$. Let S_n , $n = 1, 2, \dots$, denote their partial sums and $N(C) = \min\{k: S_k > C\}$, $C \geq 0$. A general functional central limit theorem is proved for the process $N(C)$ and its application is shown in different fields. Later on a similar result has been proved for a more general process, namely

$$N_p(C) = \min\{k: S_k > Ck^p\}, \quad C \geq 0, 0 \leq p < 1.$$

Nonuniform Rates of Convergence to Normality of m -Dependent and Linear Processes

R. Dasgupta, *Indian Statistical Institute, Calcutta, India*

Nonuniform rates of convergence of the standardised sample sum to normality are studied for non stationary m -dependent processes when general moments of order higher than 2 of the underlying r.v.'s exist. A similar study is carried out for linear processes when all the moments of the r.v.'s exist but the m.g.f. may not exist. As a by product of these results probabilities of deviations are computed.

Some Limit Theorems in Urn Models with Indistinguishable Balls

V.V. Menon and N.K. Indira, *Institute of Technology, Banaras Hindu University, Varanasi, India*

When n indistinguishable balls are distributed into m cells, there are two possible models, (known as Bose-Einstein Statistics), depending on whether the cells are allowed to be empty or not. We consider the number of cells containing k balls each and identify its possible limiting distributions when n & m vary, and $m \rightarrow \infty$.

Stable and Semistable Laws Characterised by Sample Mean

R.N. Pillai, *University of Kerala, Kerala, India*

Let X_1, X_2, \dots, X_n be i.i.d. random variables with distribution function $F(x)$ and $S_n = \sum_{i=1}^n X_i$. For $0 < p < 1$, $p + q = 1$,

$$\left(\frac{p}{n}\right)^{1/\alpha} S_n + \left(\frac{q}{m}\right)^{1/\alpha} S_m$$